FluWatch

Public Health Agency of Canada | Agence de la santé publique du Canada

December 7 to December 13, 2014 (week 50)

Overall Summary

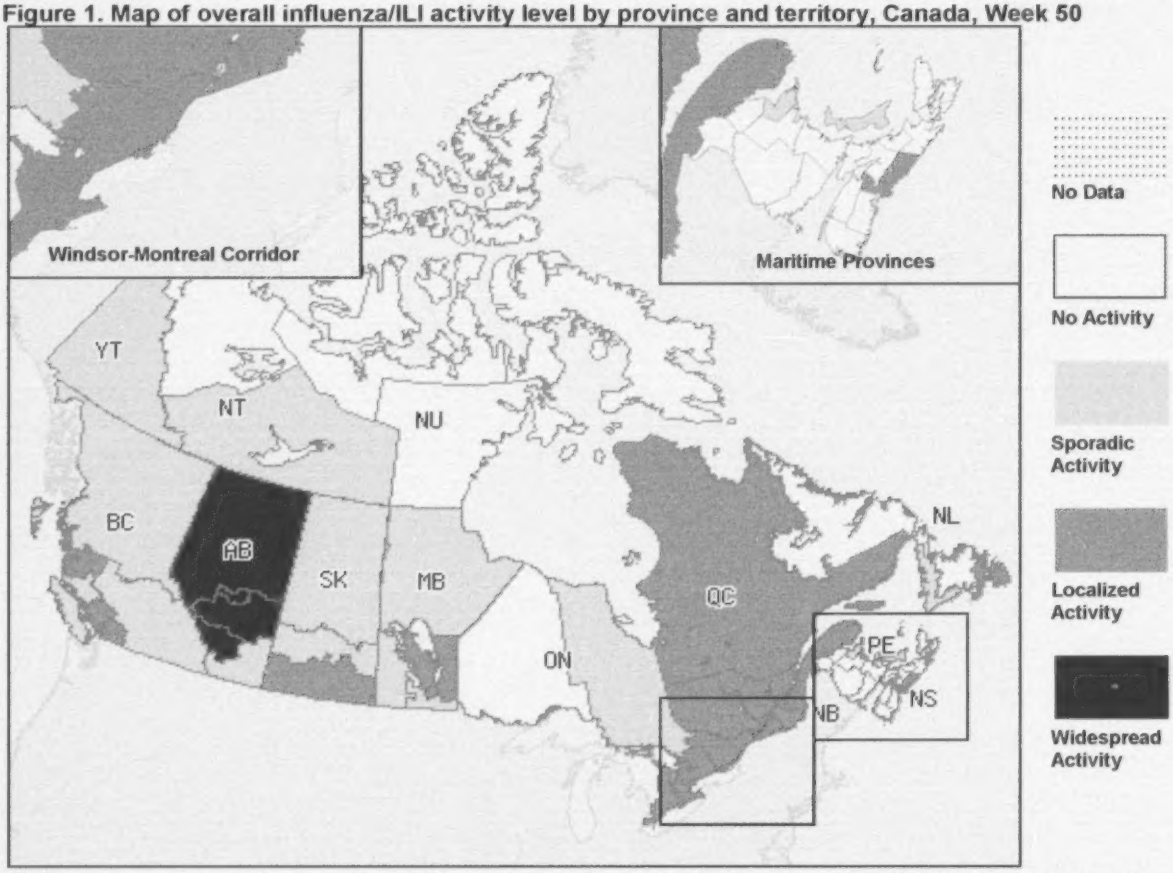
- In week 50, laboratory detections of influenza increased sharply for the fourth consecutive week. The majority of laboratory detections continued to be reported in AB, ON and QC; but with increasing activity in SK, MB and NL.
- A(H3N2) continues to be the most common type of influenza affecting Canadians. In both laboratory detections and hospitalizations, the majority of cases have been among seniors ≥65 years of age.
- Similar to the previous week, there were a large number of newly-reported laboratory-confirmed outbreaks of influenza: 72 influenza A outbreaks in 8 provinces, of which 57 were in long-term care facilities (LTCF).
- To date, the NML has found that the majority H3N2 influenza specimens are not optimally matched to the vaccine strain which may result in reduced vaccine effectiveness against the H3N2 influenza virus. However, the vaccine can still provide some protection against H3N2 influenza illness and can offer protection against other influenza strains such as A(H1N1) and B.

Are you a primary health care practitioner (General Practitioner, Nurse Practitioner or Registered Nurse) interested in becoming a FluWatch sentinel for the 2014-15 influenza season?
Contact us at FluWatch@phac-aspc.gc.ca

Influenza/ILI Activity (geographic spread)

In week 50, four regions reported widespread activity (in AB), 17 regions reported localized activity (in BC(2), SK, MB(2), ON(5), QC(5), NS, NL), and 16 regions (in NT, YK, BC(3), AB, SK(2), MB(3), ON, QC, NB, PE, and NL) reported sporadic activity.

Figure 1. Map of overall influenza/ILI activity level by province and territory, Canada, Week 50

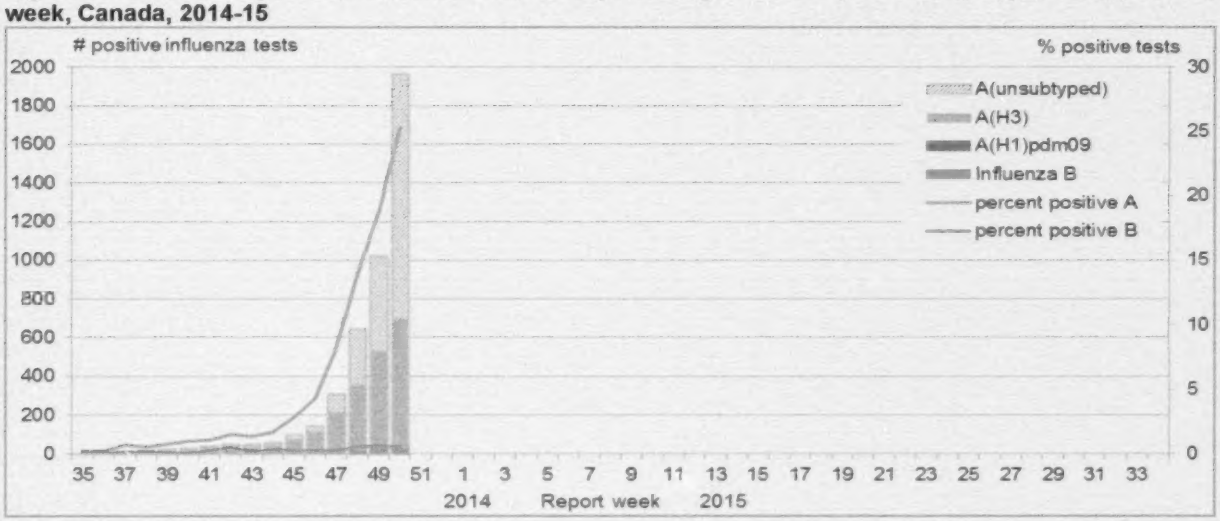


Note: Influenza/ILI activity levels, as represented on this map, are assigned and reported by Provincial and Territorial Ministries of Health, based on laboratory confirmations, sentinel ILI rates and reported outbreaks. Please refer to detailed definitions at the end of the report. Maps from previous weeks, including any retrospective updates, are available on the FluWatch website.

Influenza and Other Respiratory Virus Detections

In week 50, the number of positive influenza tests increased sharply for the fourth week in a row, to 1,963 influenza detections (25.9% of tests), predominantly due to influenza A (Figure 2). To date, 96% of influenza detections have been influenza A, and 99.6% of those subtyped have been A(H3) (Table 1). The timing of the season and predominant A(H3N2) subtype is similar to the pattern observed during the 2012-13 influenza season when percent positive for influenza peaked in week 52 (35%). To date, among the cases of influenza with reported age, the largest proportion was in adults ≥65 years of age (56%) (Table 2).

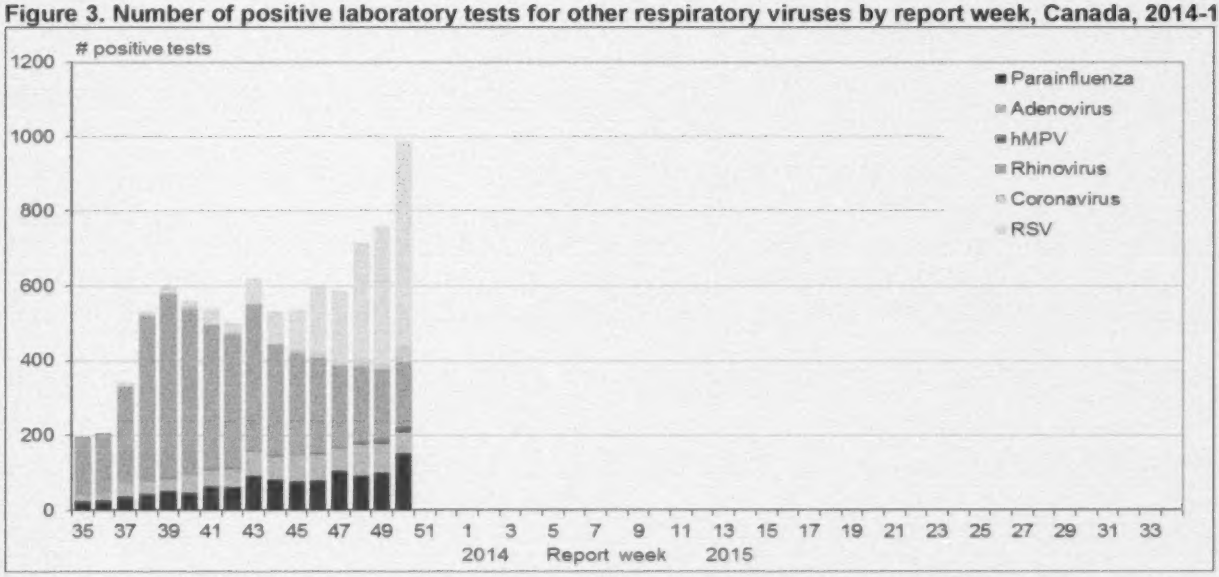
Figure 2. Number of positive influenza tests and percentage of tests positive, by type, subtype and report week, Canada, 2014-15



Detections of RSV increased sharply in week 50 and was the second most frequently detected virus, after influenza. Detections of parainfluenza and adenovirus also continue to follow their seasonal patterns of broad winter circulation. Detections of rhinovirus peaked in week 39 and continue to follow a downward trend (Figure 3).

For more details, see the weekly Respiratory Virus Detections in Canada Report.

Figure 3. Number of positive laboratory tests for other respiratory viruses by report week, Canada, 2014-15



RSV: Respiratory syncytial virus; hMPV: Human metapneumovirus

Table 1. Weekly and cumulative numbers of positive influenza specimens by type, subtype and province, Canada, 2014-15

Reporting provinces[1]	Weekly (December 7 to December 13, 2014)					Cumulative (August 24 to December 13, 2014)				
	Influenza A				B	Influenza A				B
	A Total	A(H1)pdm09	A(H3)	A(UnS)	B Total	A Total	A(H1)pdm09	A(H3)	A(UnS)	B Total
BC	82	0	55	27	2	262	2	218	42	13
AB	520	0	310	210	10	1441	0	1203	238	52
SK	52	0	23	28	1	113	0	49	62	2
MB	22	0	14	8	1	36	0	28	8	2
ON	287	0	210	77	4	630	4	477	149	23
QC	933	0	0	933	23	1757	0	0	1757	71
NB	3	0	2	1	0	6	0	3	3	0
NS	4	0	0	4	1	11	0	7	4	3
PE	1	0	0	1	0	6	0	4	2	1
NL	16	0	12	4	1	21	0	16	5	1
Canada	**1,920**	**0**	**626**	**1,293**	**43**	**4283**	**6**	**2005**	**2270**	**168**
Percentage[2]	97.8%	0.0%	32.6%	67.3%	2.2%	96.2%	0.1%	46.8%	53.0%	3.8%

Table 2. Weekly and cumulative numbers of positive influenza specimens by type, subtype and age-group reported through case-based laboratory reporting[3], Canada, 2014-15

Age groups (years)	Weekly (December 7 to December 13, 2014)					Cumulative (August 24 to December 13, 2014)						
	Influenza A				B	Influenza A				B	Influenza A and B	
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	#	%
<5	55	0	7	48	4	281	4	156	121	23	304	8.5%
5-19	52	0	5	47	2	304	0	167	137	29	333	9.3%
20-44	120	0	4	116	3	461	0	204	257	19	480	13.4%
45-64	145	0	34	111	6	427	0	159	268	31	458	12.8%
65+	650	0	41	609	8	1963	2	546	1415	42	2005	56.0%
Unknown	0	0	0	0	0	1	0	0	1	0	1	0.0%
Total	1,022	0	91	931	23	3437	6	1232	2199	144	3581	100.0%
Percentage[2]	97.8%	0.0%	8.9%	91.1%	2.2%	96.0%	0.2%	35.8%	64.0%	4.0%		

[1] Specimens from NT, YT, and NU are sent to reference laboratories in other provinces. Cumulative data includes updates to previous weeks.
[2] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections.
[3] Table 2 includes specimens for which demographic information was reported. These represent a subset of all positive influenza cases reported.
UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

Antiviral Resistance

During the 2014-2015 influenza season, NML has tested 93 influenza viruses for resistance to oseltamivir and zanamivir and all were sensitive to both agents. A total of 130 (99%) influenza A viruses tested for amantadine resistance were resistant (Table 3).

Table 3. Antiviral resistance by influenza virus type and subtype, Canada, 2014-15

Virus type and subtype	Oseltamivir		Zanamivir		Amantadine	
	# tested	# resistant (%)	# tested	# resistant (%)	# tested	# resistant (%)
A (H3N2)	79	0	79	0	129	128 (99.2%)
A (H1N1)	0	0	0	0	2	2 (100%)
B	14	0	14	0	NA[1]	NA[1]
TOTAL	93	0	93	0	131	130

[1]NA: Not Applicable

Influenza Strain Characterizations

During the 2014-2015 influenza season, the National Microbiology Laboratory (NML) has characterized 30 influenza viruses [13 A(H3N2), 2 A(H1N1) and 15 influenza B]. When tested by hemagglutination inhibition (HI) assay, one influenza A (H3N2) virus was antigenically similar to A/Texas/50/2012, two influenza A (H1N1) viruses were antigenically similar to A/California/7/2009 and 12 influenza B viruses were antigenically similar to the B/Massachusetts/2/2012 (Yamagata lineage) recommended by the WHO for the 2014-15 seasonal influenza vaccine. Five influenza A(H3N2) viruses and three influenza B viruses showed reduced titers to antisera produced against strains recommended for the seasonal influenza vaccine. Seven of the 13 influenza A (H3N2) viruses were antigenically similar to the A/Switzerland/9715293/2013, which is the influenza A/H3N2 component recommended for the 2015 Southern Hemisphere influenza vaccine (Figure 4). Additionally, 58 A(H3N2) viruses were unable to be tested by HI assay; however, sequence analysis showed that 57 belonged to a genetic group that typically shows reduced titers to A/Texas/50/2012.

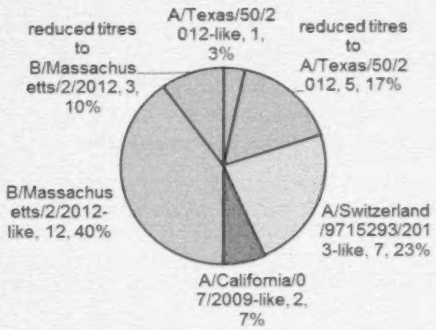

reduced titres to B/Massachusetts/2/2012, 3, 10%
A/Texas/50/2012-like, 1, 3%
reduced titres to A/Texas/50/2012, 5, 17%
B/Massachusetts/2/2012-like, 12, 40%
A/Switzerland/9715293/2013-like, 7, 23%
A/California/07/2009-like, 2, 7%

Figure 4. Influenza strain characterizations, Canada, 2014-15, N = 30

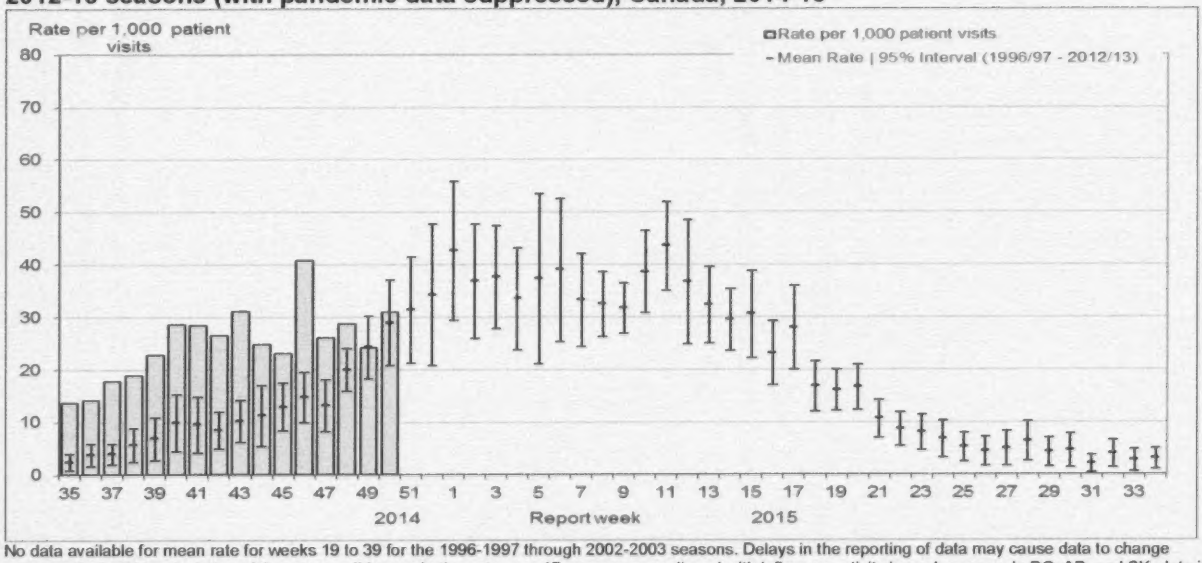
The NML receives a proportion of the number of influenza positive specimens from provincial laboratories for strain characterization and antiviral resistance testing. Characterization data reflect the results of haemagglutination inhibition (HAI) testing compared to the reference influenza strains recommended by WHO.

The recommended components for the 2014-2015 northern hemisphere trivalent influenza vaccine include: an A/California/7/2009(H1N1)pdm09-like virus, an A/Texas/50/2012 (H3N2)-like virus, and a B/Massachusetts/2/2012-like virus (Yamagata lineage). For quadrivalent vaccines, the addition of a B/Brisbane/60/2008-like virus is recommended.

Influenza-like Illness Consultation Rate

The national influenza-like-illness (ILI) consultation increased in week 50 to 30.91 consultations per 1,000, which is within expected levels for week 50 (Figure 5). This week, the rates were highest among the 0 to 5 years of age group and lowest among the 5 to 19 years of age group.

Figure 5. Influenza-like-illness (ILI) consultation rates by report week, compared to the 1996-97 through to 2012-13 seasons (with pandemic data suppressed), Canada, 2014-15

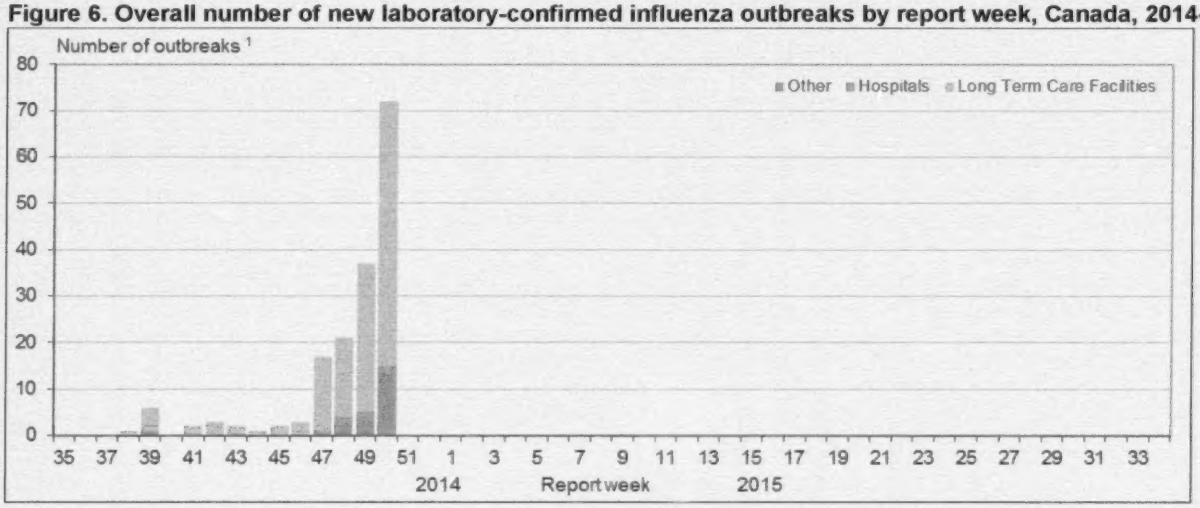


No data available for mean rate for weeks 19 to 39 for the 1996-1997 through 2002-2003 seasons. Delays in the reporting of data may cause data to change retrospectively. The calculation of the average ILI consultation rate over 17 seasons was aligned with influenza activity in each season. In BC, AB, and SK, data is compiled by a provincial sentinel surveillance program for reporting to FluWatch. Not all sentinel physicians report every week.

Influenza Outbreak Surveillance

In week 50, 72 new outbreaks of influenza A were reported: 57 in long-term care facilities (LTCF), two in hospitals and 13 in institutional or community settings (Figure 6). An additional six outbreaks of ILI were reported in schools. Among the outbreaks in which the influenza subtype was known, 12 LTCF outbreaks, eight institutional or community setting outbreaks, and one hospital outbreak were associated with A(H3N2). To date this season, 141 outbreaks in LTCF have been reported. The number of outbreaks reported is similar to the number reported in week 51 during the 2012-13 influenza season when influenza A(H3N2) also predominated.

Figure 6. Overall number of new laboratory-confirmed influenza outbreaks by report week, Canada, 2014-2015

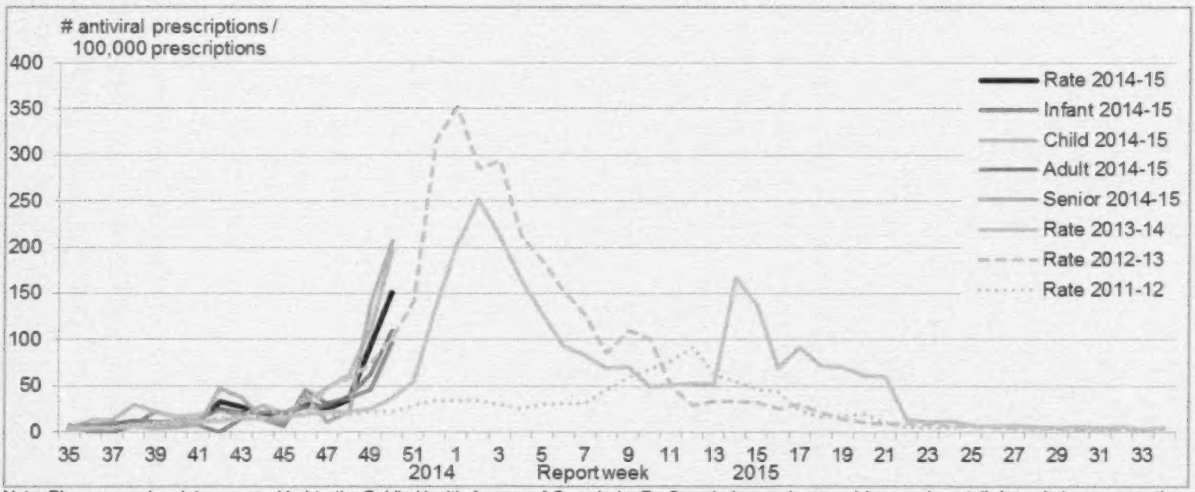


[1]All provinces and territories except NU report influenza outbreaks in long-term care facilities. All provinces and territories with the exception of NU and QC report outbreaks in hospitals. Outbreaks of influenza or influenza-like-illness in other facilities are reported to FluWatch but reporting varies between jurisdictions. Outbreak definitions are included at the end of the report.

Pharmacy Surveillance

During week 50, the proportion of prescriptions for antivirals increased to 150.8 antiviral prescriptions per 100,000 total prescriptions, which is higher than the previous three seasons (Figure 7). The rates were highest in seniors and children (207 and 197 per 100,000 antiviral prescriptions respectively).

Figure 7 – Proportion of prescription sales for influenza antivirals by age-group and week, Canada, 2014-15



Note: Pharmacy sales data are provided to the Public Health Agency of Canada by Rx Canada Inc. and sourced from major retail drug chains representing over 2,500 stores nationwide (excluding Nunavut) in 85% of Health Regions. Data provided include the number of new antiviral prescriptions (for Tamiflu and Relenza) and the total number of new prescriptions dispensed by Province/Territory and age group. Age-groups: Infant: 0-2y, Child: 2-18y; Adult: 19-64y, Senior: ≥65y

Sentinel Hospital Influenza Surveillance

Paediatric Influenza Hospitalizations and Deaths (IMPACT)

In week 50, 38 laboratory-confirmed influenza-associated paediatric (≤16 years of age) hospitalizations were reported by the Immunization Monitoring Program Active (IMPACT) network: 37 cases of influenza A and one case of influenza B (Figure 8a). Among reported cases, 16 (42%) were <2 years of age, 19 (46%) were 2 to 9 years of age and three (8%) were 10-16 years of age. Three cases, all 5-9 years of age, were admitted to the ICU. To date this season, 139 hospitalizations have been reported by the IMPACT network, 125 (90%) of which were cases of influenza A. Among cases for which the influenza A subtype was reported, 97% (72/74) were A(H3N2). Children <5 years of age represented 62% of cases (Table 4). To date, 12 cases were admitted to the ICU, of which 8 (67%) were 2 to 9 years of age (Figure 9a).

Note: The number of hospitalizations reported through IMPACT represents a subset of all influenza-associated paediatric hospitalizations in Canada. Delays in the reporting of data may cause data to change retrospectively.

Adult Influenza Hospitalizations and Deaths (PCIRN)

In week 50, 60 laboratory-confirmed influenza-associated adult (≥16 years of age) hospitalizations were reported by the PHAC/CIHR Influenza Research Network (PCIRN) Serious Outcomes Surveillance (SOS) network. Fifty-eight cases (97%) were influenza A (Figure 8b). To date this season, 139 cases have been reported; 137 (98.5%) with influenza A. The majority of cases (86%) were among adults ≥65 years of age (Table 5). Nine ICU admissions have been reported and the majority of cases (77.8%) were adults ≥65 years of age with underlying conditions or comorbidities. Four deaths have been reported, all adults >65 years of age (Figure 9b).

Note: The number of hospitalizations reported through PCIRN represents a subset of all influenza-associated adult hospitalizations in Canada. Delays in the reporting of data may cause data to change retrospectively.

Table 4 – Cumulative numbers of paediatric hospitalizations with influenza reported by the IMPACT network, Canada, 2014-15

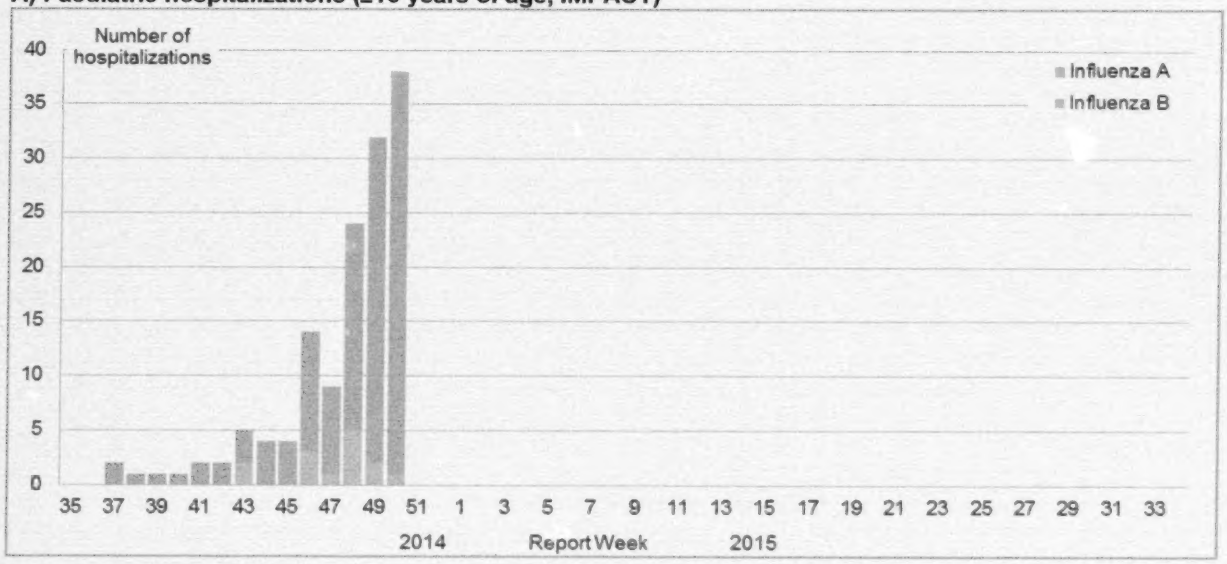
Age groups	Cumulative (24 Aug. 2014 to 13 Dec. 2014)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)[2]	Total	# (%)
0-5m	17	0	11	6	2	19 (13.7%)
6-23m	24	1	11	12	1	25 (18.0%)
2-4y	37	1	22	14	5	42 (30.2%)
5-9y	34	0	22	12	4	38 (27.3%)
10-16y	13	0	6	7	2	15 (10.8%)
Total	125	2	72	51	14	139
%[1]	89.9%	1.6%	57.6%	40.8%	10.1%	100.0%

Table 5 – Cumulative numbers of adult hospitalizations with influenza reported by the PCIRN-SOS network, Canada, 2014-15

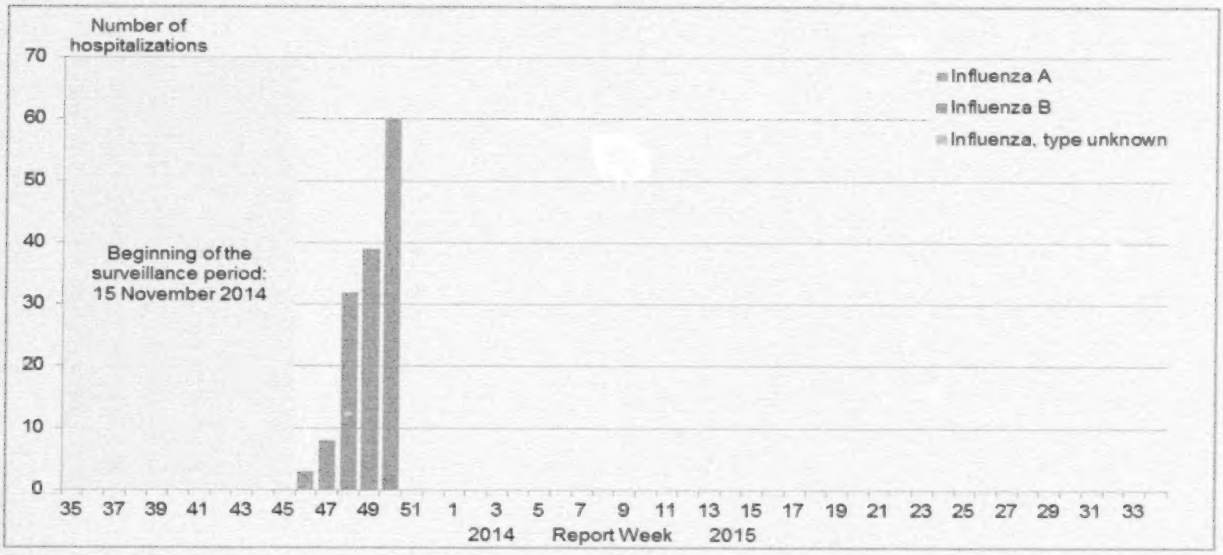
Age groups (years)	Cumulative (15 Nov. 2014 to 13 Dec. 2014)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	# (%)
16-20	0	0	0	0	0	0 (%)
20-44	8	0	3	5	0	8 (6%)
45-64	11	0	5	6	0	11 (8%)
65+	118	0	20	98	2	120 (86%)
Total	137	0	28	109	2	139
%	99%	0%	20%	80%	1%	100%

[1] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections. UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

Figure 8 – Number of cases of influenza reported by sentinel hospital networks, by week, Canada, 2014-15
A) Paediatric hospitalizations (≤16 years of age, IMPACT)



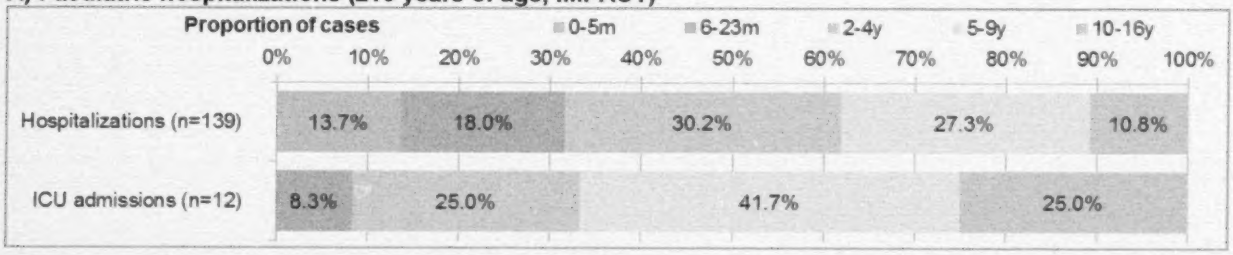
B) Adult hospitalizations (≥16 year of age, PCIRN-SOS)



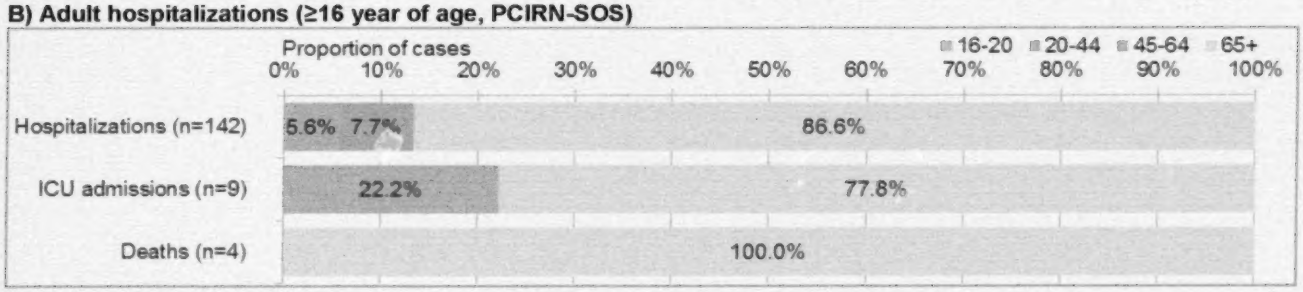
Note: Data for week 46 is based on data collected for 1 day only and do not represent the number of hospitalizations for the entire week.

Figure 9 – Percentage of hospitalizations, ICU admissions and deaths with influenza reported by age-group, Canada, 2014-15

A) Paediatric hospitalizations (≤16 years of age, IMPACT)



B) Adult hospitalizations (≥16 year of age, PCIRN-SOS)



Provincial/Territorial Influenza Hospitalizations and Deaths

In week 50, 113 laboratory-confirmed influenza-associated hospitalizations were reported from participating provinces and territories*; all but four with influenza A, and 65% were patients ≥65 years of age. Since the start of the 2014-15 season, 492 hospitalizations have been reported; 476 (97%) with influenza A. Among cases for which the subtype of influenza A was reported, 99% (374/376) were A(H3N2). The majority of cases (59%) were ≥65 years of age (Table 6). Ten ICU admissions have been reported in adults ≥65 years of age with influenza A. Twenty-seven deaths with influenza A have been reported: one child <5 years of age, one adult 45-64 years and 25 adults ≥65 years of age. Detailed clinical information (e.g. underlying medical conditions) is not known for these cases.

* Note: Influenza-associated hospitalizations are not reported to PHAC by the following Provinces and Territory: BC, NU, QC, and NB. Only hospitalizations that require intensive medical care are reported by Saskatchewan. ICU admissions are not distinguished among hospital admissions reported from Ontario. Data may also include cases reported by the IMPACT and PCIRN networks. The number of new influenza-associated hospitalizations and deaths reported for the current week may include cases from Ontario that occurred in previous weeks, as a result of retrospective updates to the cumulative total. It is important to note that the hospitalization or death does not have to be attributable to influenza, a positive laboratory test is sufficient for reporting.

Table 6 – Cumulative number of hospitalizations with influenza reported by the participating provinces and territories, Canada, 2014-15

Age groups (years)	Cumulative (24 Aug. 2014 to 13 Dec. 2014)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	# (%)
0-4	50	1	40	9	0	50 (10%)
5-19	39	0	29	10	2	41 (8%)
20-44	34	1	26	7	4	38 (8%)
45-64	58	0	50	8	2	60 (12%)
65+	283	0	217	66	7	290 (59%)
Unknown	12	0	12	0	1	13 (3%)
Total	476	2	374	100	16	492
Percentage[1]	96.7%	0.4%	78.6%	21.0%	3.3%	100.0%

[1] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections.
UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

See additional data on Reported Influenza Hospitalizations and Deaths in Canada: 2009-10 to 2014-15 on the Public Health Agency of Canada website.

Emerging Respiratory Pathogens

Human Avian Influenza
Influenza A(H7N9): Since the last FluWatch report, 11 new laboratory-confirmed cases of human infection with avian influenza A(H7N9) virus have been reported by the World Health Organization. Globally to December 18, 2014, the WHO has been informed of a total of 469 laboratory-confirmed human cases with avian influenza A(H7N9) virus, including 182 deaths.

Documents related to the public health risk of influenza A(H7N9), as well as guidance for health professionals and advice for the public is updated regularly on the following websites:
PHAC – Avian influenza A(H7N9)
WHO – Avian Influenza A(H7N9)

Middle East Respiratory Syndrome Coronavirus (MERS-CoV)
Since the last FluWatch report, 11 laboratory-confirmed cases and 4 deaths of MERS-CoV have been reported by the World Health Organization. Globally, from September 2012 to December 18, 2014, the WHO has been informed of a total of 938 laboratory-confirmed cases of infection with MERS-CoV, including 343 deaths. All cases have either occurred in the Middle East or have had direct links to a primary case infected in the Middle East. The public health risk posed by MERS-CoV in Canada remains low (see the PHAC Assessment of Public Health Risk).

Documents related to the public health risk of MERS-CoV, as well as guidance for health professionals and advice for the public is updated regularly on the following websites:
PHAC – Middle East respiratory syndrome coronavirus (MERS-CoV)
WHO – Coronavirus infections

Avian Influenza A(H5)
The Canadian Food Inspection Agency (CFIA) is continuing its investigation into an outbreak of highly pathogenic avian influenza H5N2 virus in British Columbia's Fraser Valley. To date, there have been ten infected premises. As part of regular investigation activities, CFIA is fully tracing movements in and out of these sites. This may lead to further premises being identified and depopulated, which would not be unexpected. While there are no reports of H5N2 related illness in humans, as a precautionary measure public health officials are monitoring workers who are exposed to affected poultry. Avian influenza viruses do not pose risks to food safety when poultry and poultry products are properly handled and cooked. Avian influenza rarely affects humans that do not have consistent contact with infected birds. Further information on the outbreak is provided on the following CFIA.
CFIA - Notifiable Avian Influenza

Enterovirus D68 (EV-D68)
Information related to enterovirus D68, as well as guidance for health professionals and advice for the public is updated regularly on the following website:
PHAC – Non-polio enterovirus

International Influenza Reports

World Health Organization influenza update

World Health Organization FluNet

WHO Influenza at the human-animal interface

Centers for Disease Control and Prevention seasonal influenza report

European Centre for Disease Prevention and Control - epidemiological data

South Africa Influenza surveillance report

New Zealand Public Health Surveillance

Australia Influenza Report

Pan-American Health Organization Influenza Situation Report

FluWatch Definitions for the 2014-2015 Season

Abbreviations: Newfoundland/Labrador (NL), Prince Edward Island (PE), New Brunswick (NB), Nova Scotia (NS), Quebec (QC), Ontario (ON), Manitoba (MB), Saskatchewan (SK), Alberta (AB), British Columbia (BC), Yukon (YT), Northwest Territories (NT), Nunavut (NU).

Influenza-like-illness (ILI): Acute onset of respiratory illness with fever and cough and with one or more of the following - sore throat, arthralgia, myalgia, or prostration which is likely due to influenza. In children under 5, gastrointestinal symptoms may also be present. In patients under 5 or 65 and older, fever may not be prominent.

ILI/Influenza outbreaks

Schools: Greater than 10% absenteeism (or absenteeism that is higher (e.g. >5-10%) than expected level as determined by school or public health authority) which is likely due to ILI. Note: it is recommended that ILI school outbreaks be laboratory confirmed at the beginning of influenza season as it may be the first indication of community transmission in an area.

Hospitals and residential institutions: two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case. Institutional outbreaks should be reported within 24 hours of identification. Residential institutions include but not limited to long-term care facilities (LTCF) and prisons.

Workplace: Greater than 10% absenteeism on any day which is most likely due to ILI.

Other settings: two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case; i.e. closed communities.

Note that reporting of outbreaks of influenza/ILI from different types of facilities differs between jurisdictions.

Influenza/ILI Activity Levels

1 = No activity: no laboratory-confirmed influenza detections in the reporting week, however, sporadically occurring ILI may be reported

2 = Sporadic: sporadically occurring ILI and lab confirmed influenza detection(s) with **no outbreaks** detected within the influenza surveillance region†

3 = Localized: (1) evidence of increased ILI* ;
(2) lab confirmed influenza detection(s);
(3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring in **less than 50% of the influenza surveillance region**†

4 = Widespread: (1) evidence of increased ILI*;
(2) lab confirmed influenza detection(s);
(3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring **in greater than or equal to 50% of the influenza surveillance region**†

Note: ILI data may be reported through sentinel physicians, emergency room visits or health line telephone calls.

** More than just sporadic as determined by the provincial/territorial epidemiologist.*

† Influenza surveillance regions within the province or territory as defined by the provincial/territorial epidemiologist.

We would like to thank all the Fluwatch surveillance partners who are participating in this year's influenza surveillance program.

This report is available on the Public Health Agency website at the following address: http://www.phac-aspc.gc.ca/fluwatch/index.html.

Ce rapport est disponible dans les deux langues officielles.